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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/857,606
Filing Date: August 02, 2001
Appellant(s): DAHLBACK ET AL.

Sean O'Hanlon
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 14 December 2005 appealing from the Office action mailed 21 June 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,023,048 A	MARDON et al.	6-1991
5,211,774 A	GARDE et al	5-1993
5,790,623 A	VAN SWAM	8-1998
5,254,308 A	GARDE et al.	10-1993

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

---Claims 13, 22 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification only provides support for the range of O being 500-1600 ppm. Thus, the range presently claimed is not fully supported in the specification as filed.

---Claims 13 and 35 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Mardon et al (US 5,023,048) as supported by Van Swam (US 5,790,623) and Garde et al (US 5,254,308).

Mardon et al anticipate the invention as claimed. Mardon et al teach (see abstract) a Zr-alloy used as a cladding tube for nuclear fuel that contains 0.35-0.65 wt% Sn, 0.20-0.65 wt% Fe and 0.35-0.65 wt% Nb. This composition overlaps the presently claimed range at 0.65 wt% Sn, 0.3-0.6 wt% Fe and at 0.65 wt% Nb. The alloy further contains 900-1600 ppm O. See MPEP 2131.03. Since Si is not intentionally added to

the alloy of Mardon et al, one of ordinary skill in the art would have expected the alloy to inherently contain only an impurity amount.

Regarding claim 35, Mardon et al teach the alloy as claimed. Since the Si is only optionally present, its presence in not required. Thus, Mardon et al teach the composition.

---Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mardon et al (US 5,023,048) in view of Garde et al (US 5,211,774).

The teachings of Mardon et al are described above.

However, Mardon et al do not teach including Si at 50-120 ppm.

Garde et al teach (see abstract) a similar zirconium-based alloy for fuel claddings (see col. 1, lines 6-13) that contains 50-200 ppm Si and typically 100 ppm for the purpose of reduced hydrogen absorption.

Therefore, it would have been obvious to one of ordinary skill in the art to have added 100 ppm Si as taught by Garde et al to the alloy of Mardon et al because the Si addition would improve the resistance of the alloy to hydrogen absorption.

New Grounds of Rejection

---Claims 22, 23, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mardon et al (US 5,023,048) in view of van Swam (US 5,790,623).

Mardon et al teach (see col 2, lines 55-59) that the inner tubular layer (see Figure) is made of a Zr-alloy of conventional type such as zircaloy-4.

However, Mardon et al do not expressly teach that the cladding tube included an inner layer that was (1) more ductile than the cladding tube alloy and (2) the more ductile layer was made from a Zr alloy with less than 0.5 wt% alloying elements.

Van Swam teaches (see col 7, lines 45-49 and Figure 2B) cladding tubes for nuclear fuel rods, particularly multi-layered tubes. The innermost layer was either pure Zr or a Zr-0.4Fe alloy. These alloy layers provided protection against the cladding tube interacting with the nuclear fuel.

Therefore, it would have been obvious to one of ordinary skill in the art to have added the inner protective layer of pure Zr or Zr-0.4Fe as taught by van Swam to the inner circumference of the cladding tube of Mardon et al because the inner protective layer of pure Zr or Zr-0.4Fe operated to provide protection against interactions between the cladding tube and the nuclear fuel rod.

With respect to the fact that the inner protective layer had more ductility than the ductility of the alloy, the inner protective layer of van Swam is identical to the instantly disclosed protective layer. Thus, one of ordinary skill in the art would have expected the inner protective layer to have the ductility as claimed.

---Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mardon et al (US 5,023,048) in view of Garde et al (US 5,211,774) as applied above to claim 38, and further in view of van Swam (US 5,790,623).

Mardon et al teach (see col 2, lines 55-59) that the inner tubular layer (see Figure) is made of a Zr-alloy of conventional type such as zircaloy-4.

However, Mardon et al do not expressly teach that the cladding tube included an inner layer that was (1) more ductile than the cladding tube alloy and (2) the more ductile layer was made from a Zr alloy with less than 0.5 wt% alloying elements.

Van Swam teaches (see col 7, lines 45-49 and Figure 2B) cladding tubes for nuclear fuel rods, particularly multi-layered tubes. The innermost layer was either pure Zr or a Zr-0.4Fe alloy. These alloy layers provided protection against the cladding tube interacting with the nuclear fuel.

Therefore, it would have been obvious to one of ordinary skill in the art to have added the inner protective layer of pure Zr or Zr-0.4Fe as taught by van Swam to the inner circumference of the cladding tube of Mardon et al because the inner protective layer of pure Zr or Zr-0.4Fe operated to provide protection against interactions between the cladding tube and the nuclear fuel rod.

With respect to the fact that the inner protective layer had more ductility than the ductility of the alloy, the inner protective layer of van Swam is identical to the instantly disclosed protective layer. Thus, one of ordinary skill in the art would have expected the inner protective layer to have the ductility as claimed.

(10) Response to Argument

Appellant has presented the following arguments:

---The specification states that oxygen was present at small amounts, and thus, fully supports the claimed range of "up to 1600 ppm O".

In response, the Examiner disagrees. The specification indicates that there are impurities in the alloy, but that they should be kept below a certain maximum allowable amount. However, the disclosure of O was outside of that of the impurities, as indicated by the fact that Appellant's specification states "It should however be noted that small amounts of impurities may exist in the alloy. ... Furthermore, small amounts of Si and O may exist in the alloy." This indicates that the amounts of Si and O added are not impurity levels and that they are intentional additions to the alloy. Hence, one of ordinary skill in the art would not consider an O range of "up to 1600 ppm" being fully supported by the specification as filed. The only range of O supported by the specification is 500-1600 ppm.

---The claims are directed to a cladding tube, which requires that the portion of the tube made form the alloy be more than 50% of the thickness of the tube.

In response, Appellant has attempted to give the term "cladding tube" a special definition to mean the part of a nuclear fuel cladding which has the greatest thickness. However, the specification does not support such a special definition. Thus, the Examiner must give the claims their broadest reasonable interpretation. A cladding tube is any tube shaped object which surrounds a cylindrical object. Hence, Mardon et al meets the claim limitation of being a cladding tube. Alternatively, the transitional claim language "being made from" has not been given a special definition, and, thus, is treating as being open claim language, which is to be treated similarly to "comprising", in which case Mardon et al would still anticipate the claim. Even if the transitional phrase "being made from" were treated similarly to "consisting essentially of", Appellant

has not demonstrated that the interior layer of Mardon et al would materially affect the novel characteristics of the claimed cladding tube. Further, "being made from" cannot mean "consisting of", since further dependent claims require an inner surface layer, which would mean that the cladding tube did not consist of only the claimed alloy composition. In conclusion, if the term "cladding tube" is to be construed in the manner in which Appellant argues, where is the proof of such definition? The Examiner would assume that if the definition were so clear cut as Appellant argues, Appellant would easily have found any sort of literature or patent setting forth the specific definition. However, no evidence as to the argued specific definition of the term "cladding tube" has been provided. As such, the Examiner can only assume that "cladding tube" does not have the asserted special definition.

--- Mardon et al merely teaches end points that touch the claimed ranges, not the full scope of the claimed ranges and therefore does not anticipate nor obviate the claimed invention due to a showing of unexpected results.

In response, the Examiner does not find this argument persuasive. In MPEP 2131.03, the requirement for anticipation if end points of a range are touching is that the prior art teach the range with "sufficient specificity". In the case of metal alloys, especially with an alloy with so few components, a clearly disclosed range with end points clearly explains to one of ordinary skill in the art what the ranges of the alloy are, and thus, is disclosed with "sufficient specificity". This rejection is made regardless of the preferred embodiments disclosed in the prior art, as the teachings of the prior art

should not be construed as being limited only to the specific, preferred embodiments disclosed.

---With respect to claims 22 and 36, Mardon et al teach a specific composition for the inner tubular layer, which is not the composition of van Swam.

In response, new grounds of rejection have been entered above to correctly reflect that it would have been obvious to one of ordinary skill in the art to have added the inner protective layer of van Swam to the cladding tube of Mardon et al.

---It is Appellant's understanding that in a duplex tube, such as that shown by Mardon et al, the inner component is less ductile than the alloy of the outer component.

In response, without objective proof of this statement, it cannot be relied on to overcome the rejection grounds. Appellant's statements cannot replace evidence. See MPEP 2145.I.

---The Examiner did not address claims 23 and 37 individually, and, thus, these claims have not been rejected.

In response, Appellant's attention is directed to the final rejection. Claims 23 and 37 were addressed along with the rejection of claims 22 and 36. In view of the new grounds of rejection entered above, the protective inner layer of van Swam included a Zr-0.4Fe alloy. Thus, the limitations of claims 23 and 37 are met by the prior art.

---It would not have been obvious to one of ordinary skill in the art to have take none element (Si) out of context of the alloy of Garde et al, and to have added that element to the alloy of Mardon et al.

In response, the function of Si within a low alloy content Zr alloy was taught by Garde et al to be for strength and for grain refinement. The function of Si operates independent of any other element in the alloy (in other words, it does not act in conjunction with any other element). One of ordinary skill in the art would have expected the Si to have the same effect in similar low alloy content Zr alloys, such as the alloy of Mardon et al.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,

Harry D. Wilkins, III
Patent Examiner
Art Unit 1742

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SUPERVISORY PATENT EXAMINER
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Conferees:

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APPEAL CONFEREE: Robert J. Warden, Jr.
Director's Designee
for New Grounds
of Rejection in Examiner's
Answer.